TOSHIBA
Leading Innovation

OUTDOOR UNIT INSTALLATION MANUAL

AIR CONDITIONER (MULTI-SPLIT TYPE)

For general public use

Outdoor Unit
RAS-M14GAV-E
RAS-M18UAV-E
RAS-M14GACV-E
RAS-M18GACV-E

ENGLISH EN

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* Please read this installation manual carefully before installing the air conditioner.

IMPORTANT NOTICE

- For details on how to install the indoor units, refer to the installation manual accompanying the indoor units.

1 PRECAUTIONS FOR SAFETY

Be sure to read this installation manual carefully before installing.
The supplied CD-ROM contains the installation manual translated into many languages.
Recommend to the owner to perform maintenance periodically when using over long periods of time.
Be sure to follow the precautions provided here to avoid safety risks.
The symbols and their meanings are shown below.

⚠ DANGER	It indicates that incorrect use of this unit can result in a high possibility of severe injury(*1) or death.
⚠ WARNING	It indicates that incorrect use of this unit may cause severe injury or death.
⚠ CAUTION	It indicates that incorrect use of this unit may cause personal injury(*2), or property damage(*3).

*1: A severe injury refers to blindness, injury, burns (hot or cold), electrical shock, bone fracture, or poisoning that leaves aftereffects and requires hospitalization or extended out-patient treatment.
*2: Personal injury means a slight accident, burn, or electrical shock which does not require admission or repeated hospital treatment.
*3: Property damage means greater damage which affects assets or resources.

For general public use

Power supply cord of parts of appliance for outdoor use shall be at least polychloroprene sheathed flexible cord (design H07RN-F) or cord designation 60245 IEC66 (1.5 mm^2 or more). (Shall be installed in accordance with national wiring regulations.)

⚠ CAUTION

New refrigerant air conditioner installation

THIS AIR CONDITIONER USES THE NEW HFC REFRIGERANT (R410A), WHICH DOES NOT DESTROY THE OZONE LAYER.
R410A refrigerant is apt to be affected by impurities such as water, oxidizing membranes, and oils because the pressure of R410A refrigerant is approx. 1.6 times of refrigerant R22. As well as the adoption of this new refrigerant, refrigerating machine oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigerating machine oil does not enter the refrigeration cycle of a new-refrigerant air conditioner. To avoid mixing refrigerant and refrigerating machine oil, the sizes of charging port connecting sections on the main unit are different from those for the conventional refrigerant, and different size tools are also required. For connecting pipes, use new and clean piping materials with highpressure withstand capabilities, designed for R410A only, and ensure that water or dust does not enter. Moreover, do not use any existing piping as its pressure withstand may be insufficient and may contain impurities.

⚠ DANGER

- THE MANUFACTURER SHALL NOT ASSUME ANY LIABILITY FOR THE DAMAGE CAUSED BY NOT OBSERVING THE DESCRIPTION OF THIS MANUAL.
- FOR USE BY QUALIFIED PERSONS ONLY.
- MEANS FOR DISCONNECTION FROM THE SUPPLY HAVING A CONTACT SEPARATION OF AT LEAST 3 mm IN ALL POLES MUST BE INCORPORATED IN THE FIXED WIRING.
- TURN OFF MAIN POWER SUPPLY BEFORE ATTEMPTING ANY ELECTRICAL WORK. MAKE SURE ALL POWER SWITCHES ARE OFF. FAILURE TO DO SO MAY CAUSE ELECTRIC SHOCK.
- CONNECT THE CONNECTING CABLE CORRECTLY. IF THE CONNECTING CABLE IS CONNECTED WRONGLY, ELECTRIC PARTS MAY BE DAMAGED.
- CHECK THE EARTH WIRE THAT IT IS NOT BROKEN OR DISCONNECTED BEFORE INSTALLATION.
- DO NOT INSTALL NEAR CONCENTRATIONS OF COMBUSTIBLE GAS OR GAS VAPORS. FAILURE TO FOLLOW THIS INSTRUCTION CAN RESULT IN FIRE OR EXPLOSION.
- TO PREVENT OVERHEATING THE INDOOR UNIT AND CAUSING A FIRE HAZARD, PLACE THE UNIT WELL AWAY (MORE THAN 2 M) FROM HEAT SOURCES SUCH AS RADIATORS, HEATERS, FURNACE, STOVES, ETC.
- WHEN MOVING THE AIR CONDITIONER FOR INSTALLING IT IN ANOTHER PLACE AGAIN, BE VERY CAREFUL NOT TO GET THE SPECIFIED REFRIGERANT (R410A) WITH ANY OTHER GASEOUS BODY INTO THE REFRIGERATION CYCLE. IF AIR OR ANY OTHER GAS IS MIXED IN THE REFRIGERANT, THE GAS PRESSURE IN THE REFRIGERATION CYCLE BECOMES ABNORMALLY HIGH AND IT RESULTINGLY CAUSES BURST OF THE PIPE AND INJURIES ON PERSONS.
- IN THE EVENT THAT THE REFRIGERANT GAS LEAKS OUT OF THE PIPE DURING THE INSTALLATION WORK, IMMEDIATELY LET FRESH AIR INTO THE ROOM. IF THE REFRIGERANT GAS IS HEATED BY FIRE OR SOMETHING ELSE, IT CAUSES GENERATION OF POISONOUS GAS.
- WHEN INSTALLING OR RE-INSTALLING THE AIR CONDITIONER, DO NOT INJECT AIR OR OTHER SUBSTANCES BESIDES THE DESIGNATED REFRIGERANT “R410A” INTO THE REFRIGERATING CYCLE. IF AIR OR OTHER SUBSTANCES ARE MIXED, AN ABNORMAL PRESSURE CAN OCCUR IN THE REFRIGERATING CYCLE, AND THIS CAN CAUSE AN INJURY DUE TO A PIPE RUPTURE.

⚠ WARNING

- Do not use any refrigerant different from the one specified for complement or replacement.
  Otherwise, abnormally high pressure may be generated in the refrigerant cycle, which may result in a failure or explosion of the product or an injury to your body.
- Installation work must be requested from the supplying retail dealership or professional vendors. Self-installation may cause water leakage, electrical shock, or fire as a result of improper installation.
- Specified tools and pipe parts for model R410A are required, and installation work must be done in accordance with the manual. HFC type refrigerant R410A has 1.6 times more pressure than that of conventional refrigerant (R22). Use the specified pipe parts, and ensure correct installation, otherwise damage and/or injury may be caused. At the same time, water leakage, electrical shock, and fire may occur.
- Be sure to install the unit in a place which can sufficiently bear its weight. If the load bearing of the unit is not enough, or installation of the unit is improper, the unit may fall and result in injury.
- Electrical work must be performed by a qualified electrical engineer in accordance with the code governing such installation work, internal wiring regulations, and the manual. A dedicated circuit and the rated voltage must be used. Insufficient power supply or improper installation may cause electrical shock or fire.
- Use a cabtyre cable to connect wires in the indoor/outdoor units. Midway connection, stranded wire, and single-wire connections are not allowed. Improper connection or fixing may cause a fire.
- Wiring between the indoor unit and outdoor units must be well shaped so that the cover can be firmly placed. Improper cover installation may cause increased heat, fire, or electrical shock at the terminal area.
- Be sure to use only approved accessories or the specified parts. Failure to do so may cause the unit to fall, water leakage, fire or electrical shock.
- After the installation work, ensure that there is no leakage of refrigerant gas. If the refrigerant gas leaks out of the pipe into the room and is heated by fire or something else from a fan heater, stove or gas range, it causes generation of poisonous gas.
- Make sure the equipment is properly earthed. Do not connect the earth wire to a gas pipe, water pipe, lightning conductor, or telephone earth wire. Improper earth work may be the cause of electrical shock.
- Do not install the unit where flammable gas may leak. If there is any gas leakage or accumulation around the unit, it can cause a fire.
- Do not select a location for installation where there may be excessive water or humidity, such as a bathroom. Deterioration of insulation may cause electrical shock or fire.
- Installation work must be performed following the instructions in this installation manual. Improper installation may cause water leakage, electrical shock or fire. Check the following items before operating the unit.
  - Be sure that the pipe connection is well placed and there are no leaks.
  - Check that the service valve is open. If the service valve is closed, it may cause overpressure and result in compressor damage. At the same time, if there is a leak in the connection part, it may cause air suction and overpressure, resulting in burst of the unit or injury.
- In a pump-down operation, be sure to take the following steps.
  - Ensure that no air is allowed to enter inside the refrigeration cycle.
  - After having closed the two service valves, shut down the compressor, and then remove the refrigerant pipe.

  If removing the refrigerant pipe while the compressor is operating with the service valve opened, it may cause air suction and overpressure inside the refrigeration cycle, resulting in burst of the unit or injury.
- Do not modify the power cable, connect the cable midway, or use a multiple outlet extension cable. Doing so may cause contact failure, insulation failure, or excess current, resulting in fire or electrical shock.
- If you detect any damage, do not install the unit. Contact your supplying dealer immediately.
- Never modify this unit by removing any of the safety guards or bypassing any of the safety interlock switches.

⚠ CAUTION

- Please read this installation manual carefully before installing the unit. It contains further important instructions for proper installation.
- Exposure of unit to water or other moisture before installation could result in electric shock. Do not store it in a wet basement or expose to rain or water.
- After unpacking the unit, examine it carefully for possible damage.
- Do not install in a place that can increase the vibration of the unit. Do not install in a place that can amplify the noise level of the unit or where noise and discharged air might disturb neighbors.
- This appliance must be connected to the main power supply by means of a circuit breaker depending on the place where the unit is installed. Failure to do so may cause electrical shock.
- Follow the instructions in this installation manual to arrange the drain pipe for proper drainage from the unit. Ensure that drained water is discharged. Improper drainage can result in water leakage, causing water damage to furniture.
- Tighten the flare nut with a torque wrench using the prescribed method. Do not apply excess torque. Otherwise, the nut may crack after a long period of usage and it may cause the leakage of refrigerant.
- Wear gloves (heavy gloves such as cotton gloves) for installation work. Failure to do so may cause personal injury when handling parts with sharp edges.
- Do not touch the air intake section or the aluminum fins of the outdoor unit. It may cause injury.
- Do not install the outdoor unit in a place which can be a nest for small animals. Small animals could enter and contact internal electrical parts, causing a failure or fire.
- Request the user to keep the place around the unit tidy and clean.
- Make sure to conduct a trial operation after the installation work, and explain how to use and maintain the unit to the customer in accordance with the manual. Ask the customer to keep the operation manual along with the installation manual.

REQUIREMENT OF REPORT TO THE LOCAL POWER SUPPLIER

Please make absolutely sure that the installation of this appliance is reported to the local power supplier before installation. If you experience any problems or if the installation is not accepted by the supplier, the service agency will take adequate countermeasures.

2 INSTALLATION/SERVICE TOOLS

Changes in the product and components

In air conditioners using R410A, in order to prevent any other refrigerant from being accidentally charged, the service port diameter size of the outdoor unit control valve (3 way valve) has been changed. (1/2 UNF 20 threads per inch)

- In order to increase the pressure resisting strength of the refrigerant piping, flare processing diameter and opposing flare nuts sizes have been changed. (For copper pipes with nominal dimensions 1/2 and 5/8)

Gauge manifold for R410A	Philips screwdriver	Pipe cutter	Flare tool for R410A
Charge hose for R410A	Level	Torque wrench	4 mm hexagonal wrench
Vacuum pump for R410A	Scale	Wrench (or spanner)	
Gas leakage detector for R410A	Utility knife	Reamer	

3 SPECIFICATIONS

Model		RAS-M14GAV-E	RAS-M18UAV-E	RAS-M14GACV-E	RAS-M18GACV-E
Operating conditions *1	Cooling operation	5–43°C	5–43°C	5–43°C	5–43°C
	Dry operation	5–43°C	5–43°C	5–43°C	5–43°C
	Heating operation	–10–24°C	–15–24°C	–	–
Dimension	Height	550 mm			
	Width	780 mm			
	Depth	290 mm			
Net weight		36 kg	41 kg	36 kg	40 kg
Refrigerant R410A		0.9 kg	1.2 kg	0.9 kg	1.2 kg
Power supply		1ph, 50Hz, 220–240V 1ph, 60Hz, 220V			
Maximum running current		13.2 A	14.4 A	13.2 A	13.2 A
Installation fuse rating		16 A breaker or fuse (all types can be used)			
Power cord (H07RN-F or 60245IEC66)		3-core 1.5 mm^2			
Connecting cable (H07RN-F or 60245IEC66)		4-core 1.0 mm^2			
Pipe length	Minimum for 1 unit	2 m			
	Maximum for 1 unit	20 m			
	Maximum for all units	30 m			
	Height difference	10 m			
	No additional refrigerant charge	20 m			
Refrigerant adjustment		20 g/m (21 m–30 m)			

The specifications for the performance of this air conditioner differ depending on the combination of the indoor units which will be operated.
For details, refer to the catalogue.
For operation, read the OWNER'S MANUAL packed with the indoor units.
*1 If the air conditioner is used in conditions other than above, the safety protection functions may be activated.

Table of models that can be connected

	RAS-M14GAV-E, RAS-M14GACV-E	RAS-M18UAV-E	RAS-M18GACV-E	Standard connecting pipe diameter
B	10	07 or 10 or 13	10 or 13	6.35, 9.52 mm
A	10 or 13	07 or 10 or 13 or 16	10 or 13 or 16	6.35, 9.52 mm
Total	23	29	26	–

All combinations that do not exceed the "Total" number can be installed.
The outdoor unit must be connected to at least two indoor units.
Example of indoor unit class: RAS-M10PKVP-E is abbreviated as "10".

4 OPTIONAL PARTS, ACCESSORIES

Optional installation parts

Part name	Specifications			Q'ty
Refrigerant piping *1	Indoor unit name (Abbreviation)	Liquid side (Outer diameter)	Gas side (Outer diameter)	1 ea.
	07, 10, 13	6.35 mm	9.52 mm	
	16	6.35 mm	12.7 mm	
Putty, PVC tapes				1 ea.

*1 Refrigerant piping covered with insulating material (polyethylene form, 6 mm thick).
In case the duct-type or cassette-type unit is to be installed, it shall be covered with thicker insulating material (polyethylene form, 10 mm thick).

Accessories

Installation manual	1	
CD-ROM (Installation manual)	1	
Drain nipple *2	1	
Rubber cap (Water-proof) *2	2	
F-GAS label	1	

*2 Heat pump models only

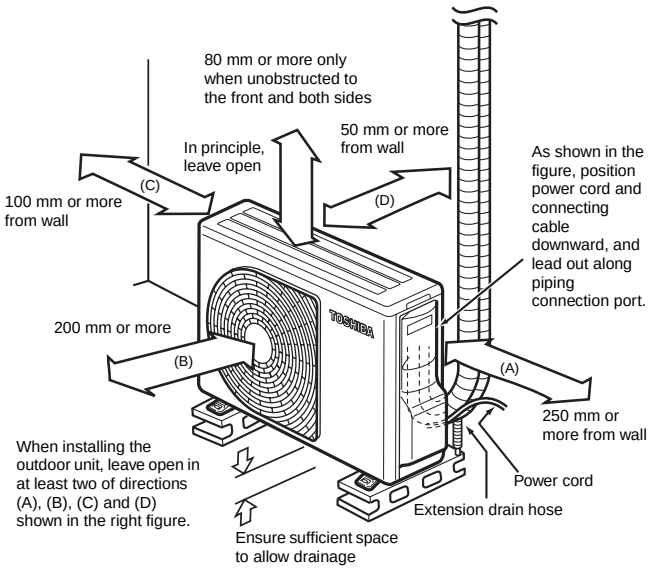
5 INSTALLATION OF OUTDOOR UNIT

Installation location

- A place which can bear the weight of the outdoor unit and does not allow an increase in noise level and vibration.
- A place where the operation noise and discharged air do not disturb neighbors.
- A place which is not exposed to a strong wind.
- A place free of combustible gases.
- A place which does not block a passageway.
- When the outdoor unit is to be installed in an elevated position, be sure to secure its feet.
- If the outdoor unit is to be mounted on a wall, make sure the platform supporting it is sturdy enough.
- The base plate should be designed and manufactured to maintain its strength over a long period of time, and sufficient consideration should be given to ensuring that the outdoor unit will not fall.
- When the outdoor unit is to be mounted high on a wall, take particular care to ensure that parts do not fall, and that the installer is protected.
- When doing installation work at ground level, it is usual to make wiring and pipe connections to the indoor units, first, and then to make connections to the outdoor units.
  However, if outdoor work is difficult it is possible, instead, to make changes to the procedure.
  For example, by making adjustments to the wiring and piping lengths on the inside (rather than the outside).
- A place where the drain water does not cause any problems.
- Install the outdoor unit in a location where there are no obstructions near its air intake or air outlet.
- When the outdoor unit is installed in a place that is always exposed to strong winds like on the coast or on a high story of a building, secure the normal fan operation using a duct or a wind shield.
- Especially in windy areas, install the unit to prevent the admission of wind.
- Installation in the following places may result in trouble. Do not install the unit in such places.
  - A place full of machine oil.
  - A saline-place such as the coast.
  - A place full of sulfide gas.
  - A place where high-frequency waves are likely to be generated, such as from audio equipment, welders, and medical equipment.

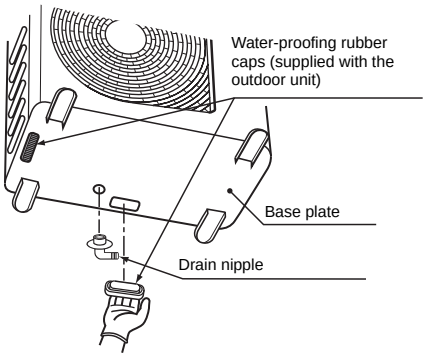
Necessary space for installation

NOTE: For installation, at least 3 sides should be kept away from obstacles (walls).



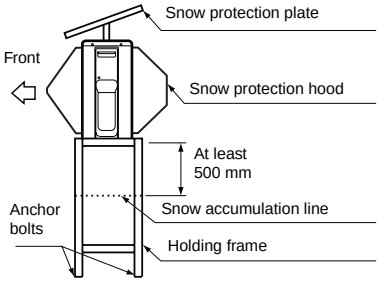
Draining off the water from the outdoor unit

- If it is necessary to drain off the water from the outdoor unit, install two water-proofing rubber caps and a drain nipple.



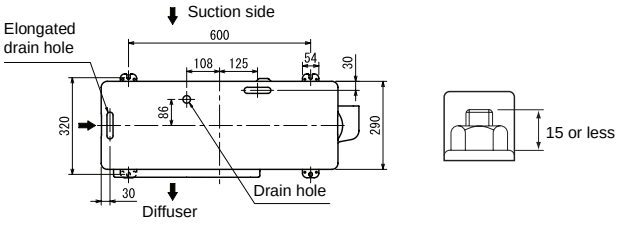
Precautions about installation in regions with snowfall and cold temperatures

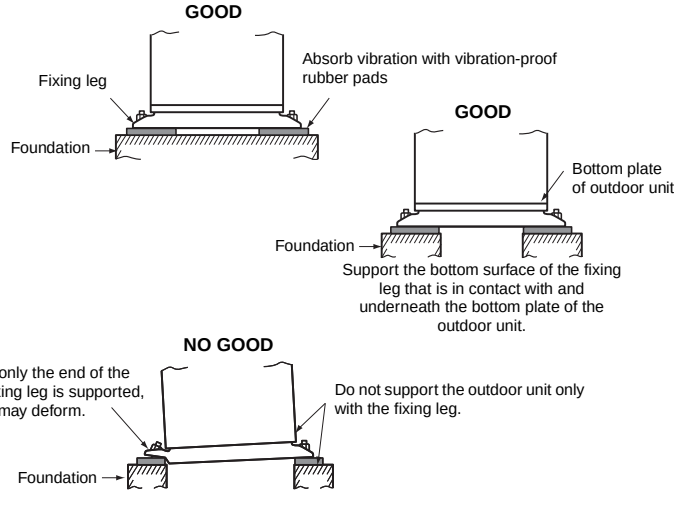
- Do not use the water-proofing rubber cap and drain nipple.
- If there is a danger that the drain water might freeze, take steps to ensure that the water will drain off in the most efficient manner.
- To protect the outdoor unit from snow accumulation, install a holding frame, and attach a snow protection hood and plate.
- Install at least 500 mm above the snow accumulation line.



Fixing the outdoor unit

- Secure the outdoor unit with the anchor bolts.
- Use 8 mm or 10 mm anchor bolts and nuts.
- Set the out margin of the anchor bolt to 15 mm or less.
- Install the outdoor unit so that it is level.
- Install the foundation and vibration-proof rubber pads to directly support the bottom surface of the fixing leg.

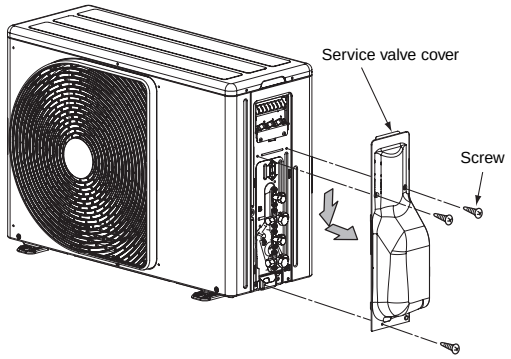




6 REFRIGERANT PIPING

How to remove the service valve cover

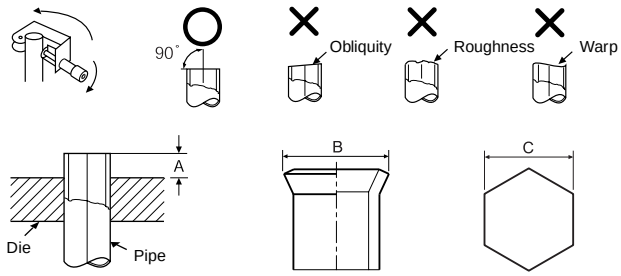
• Remove the three screws.
Pull the service valve cover in the direction of the arrow, and remove it.



Refrigerant piping connection

Flaring

1. Cut the pipe with a pipe cutter.
2. Deburr the inside of the pipe at its end.
   Take steps to ensure that the removed burrs will not enter the pipe.
3. Remove the flare nuts provided with the indoor and outdoor units, and insert them into the pipe.
4. Flare the pipe.
   The projection margin of the pipe must be checked.
5. Check that the flare has the appropriate shape.



Pipe		A		B	Flare Nut		
Outside diameter	Thickness	Rigid (clutch type) R410A tool	Imperial (wing nut type) R410A tool		C	Tighten torque	
mm	mm	mm	mm	mm	mm	N•m	kgf•m
6.35	0.8	0 to 0.5	1.5 to 2.0	9.1	17	14 to 18	1.4 to 1.8
9.52	0.8	0 to 0.5	1.5 to 2.0	13.2	22	33 to 42	3.3 to 4.2
12.7	0.8	0 to 0.5	2.0 to 2.5	16.6	26	50 to 62	5.0 to 6.2

Pipe connection

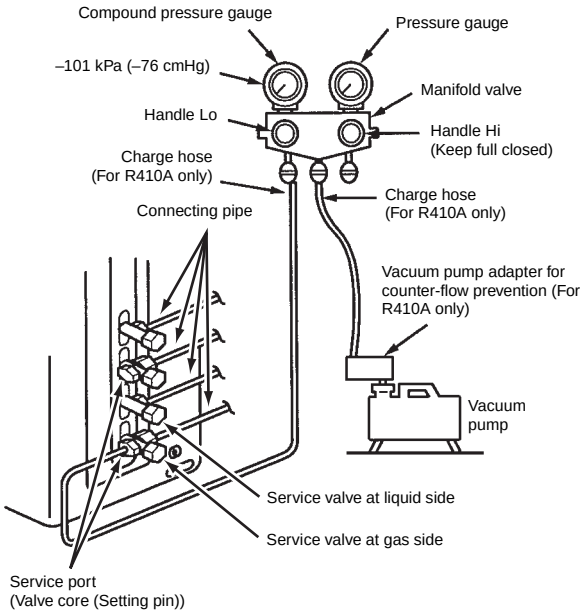
1. Ensure that the same wires and pipes are used for connecting all the indoor and outdoor units.
2. Align the centers of the connecting pipes and tighten the flare nut as much as possible with your fingers. Then tighten the nut with a wrench and torque wrench as shown in the table above.
   • If the indoor units have different capacities, connect them in the sequence of A and B starting with the unit which has the highest capacity.
   • Do not remove the flare nuts in any of the rooms where an indoor unit is not going to be connected.
   • Do not leave the pipes with their flare nuts removed standing for a prolonged period of time.
   • When connecting a capacity class 16 pipe to the indoor unit, attach the expander which is available as an optional accessory to the 9.52 mm diameter service valve of the outdoor unit.
   • When attaching the expander to the outdoor unit, be sure to fix the service valve with a wrench.

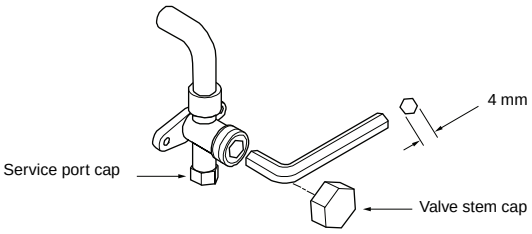
Air purge

Undertake the steps described below in each of the two rooms.
With respect to the preservation of the terrestrial environment, adopt “Vacuum pump” to purge air (Evacuate air in the connecting pipes) when installing the unit.
* Hexagon wrench (4 mm) is required.

1. Connect the charge hose. *1
   • Check that the handle Hi (manifold valve) is closed completely.
   • Attach the connecting port of the charge hose on the end with a projection to push the valve core (setting pin) to the service port of the set.
   *1 When a control valve or charge valve is connected between the charge hose and service port, the R410A refrigerant can definitely be prevented from being discharged to the atmosphere during the air purging process.
2. Open Handle Lo fully. Turn ON the vacuum pump.
   • Loosen the flare nut of the connected pipe (Gas side) a little to check that the air passes through. Retighten the flare nut.
   • If the air fails to enter, check whether the charge hose is connected securely to the service port.
   • Purge the air for 15 or more minutes, and check that a pressure level of –101 kPa (–76 cmHg) is indicated on the compound pressure gauge.
   • If the compound pressure gauge fails to indicate a pressure level of –101 kPa (–76 cmHg), it may mean that air is infiltrating from an area where a pipe is connected or other place. Check the areas where the pipes are connected.
3. Close Handle Lo completely. Turn OFF the vacuum pump.
   • Leave the vacuum pump as it is for 1 or 2 minutes, and check that the indicator of the compound pressure gauge does not return.
   • No more refrigerant needs to be added if the total pipe length is no more than 20 meters.
   • Add 20 g of refrigerant for every 1 m of piping that exceeds 21 m.
4. Disconnect the charge hose from the service port. Open the valve shaft fully with a hexaganal wrench.
5. Tighten the service port cap and valve stem cap securely.
   • Securely tighten these caps with torque in the following table.
6. Check the gas leaks after connection.

Service valve	Tighten torque			
	Valve stem cap		Service port cap	
	N•m	kgf•m	N•m	kgf•m
Liquid side (6.35)	14 to 18	1.4 to 1.8	–	–
Gas side (9.52)	33 to 42	3.3 to 4.2	14 to 18	1.4 to 1.8





CAUTION

Install in rooms that are 5 m^3 or larger. If a leak of refrigerant gas occurs inside the room, an oxygen deficiency can occur.

Adding refrigerant

- No more refrigerant needs to be added if the total pipe length is no more than 20 meters.
- Add 20 g of refrigerant for every 1 m of piping that exceeds 21 m.

Procedure for charging the refrigerant

1. After the air inside the refrigerant pipe has been purged, close the valve and, while the units are not running, charge the refrigerant.
2. If the specified amount of refrigerant cannot be charged, add the remaining refrigerant from the charge port of the service valve at the gas side while at the same time performing a cooling operation.

Precautions to be heeded while the refrigerant is being charged

- Charge the refrigerant while it is still in liquid form.
- Charging the refrigerant in the form of a gas will change the composition of the refrigerant, making normal operation impossible.

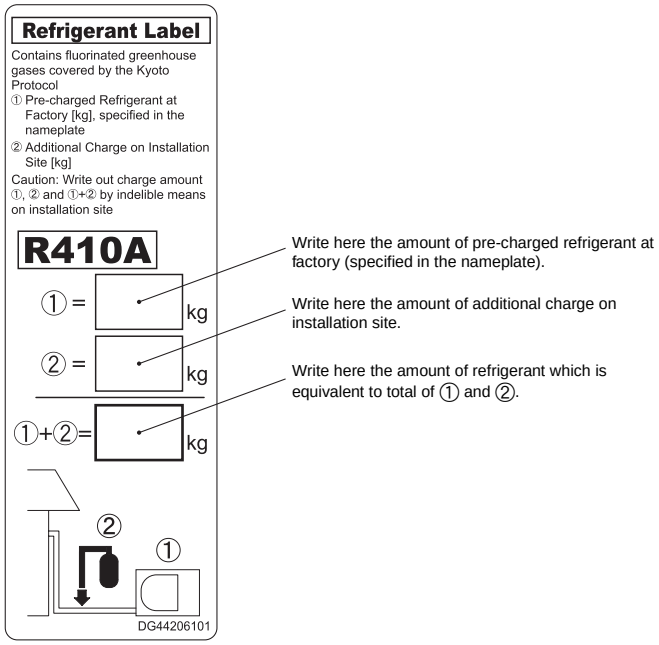
Precautions for adding refrigerant

- Use a scale having a precision with at least 10 g per index line when adding the refrigerant. Do not use a bathroom scale or similar instrument.
- Use liquid refrigerant when refilling the refrigerant. Since the refrigerant is in liquid form, it can fill quickly. Therefore, perform the filling operation carefully and insert the refrigerant gradually.

Precautions for the refrigerant

This product contains fluorinated greenhouse gases covered by the Kyoto Protocol.
Chemical name of gas: R410A
Global Warming Potential (GWP) of gas: 1975

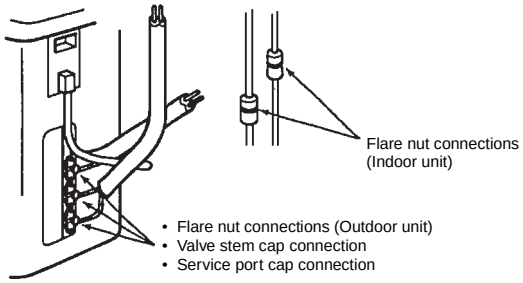
1. Paste the enclose refrigerant label adjacent to the charging and/or recovering location.
2. Clearly write the charge refrigerant quantity on the refrigerant label using indelible ink.
3. Prevent emission of the contained fluorinated greenhouse gas.
   Ensure that the fluorinated greenhouse gas is never vented the atmosphere during installation, service or disposal.
   When any leakage of the contained fluorinated greenhouse gas is detected, the leak shall be stopped and repaired as soon as possible.
4. Only qualified service personnel are allowed to access and service is product.
5. Any handling of the fluorinated greenhouse gas in the product, such as when moving the product or recharging the gas, shall comply under (EC) Regulation No.842/2006 on certain fluorinated greenhouse gases and any relevant local legislation.
6. Contact dealers, installers, etc., for any questions.



NOTE: Periodical inspections for refrigerant leaks may be required depending on European or local legislation.

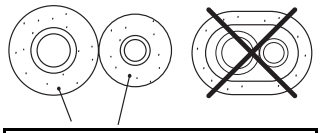
Gas leak check

- Check for gas leaks at all connections of the indoor unit and outdoor unit.
- For R410A, use the leak detector exclusively manufactured for R410A refrigerant.



Insulating the pipes

- Insulate the pipes separately for the liquid side and gas side.



Refrigerant piping covered with insulating material (polyethylene form, 6 mm thick). In case the duct-type or cassette-type unit is to be installed, it shall be covered with thicker insulating material (polyethylene form, 10 mm thick).

When installing additional indoor units at a later date

1. Set the circuit breaker to the “off” position.
2. Follow the same procedure starting with the “REFRIGERANT PIPING” item on the previous page, and install the additional indoor unit or units.

Pump-down operation (recovering refrigerant)

Undertake the steps described below in each of the two rooms.

1. Open the service valve cover of the outdoor unit.
2. Connect the charge hose to the service port.
3. Turn on the unit.
4. Set the all connected indoor units to COOL mode and start the operation.
5. Wait until at least 10 minutes have elapsed since operation was started, and then close the valve of the service valve at the liquid side.
6. Confirm that the compound pressure gauge reading is –101 kPa (–76 cmHg).
7. Close the valve of the service valve at the gas side.
8. Turn off the unit.
9. Disconnect the connection pipes at both liquid and gas side.

CAUTION

In a pump-down operation, be sure to take the following steps.
- Ensure that no air is allowed to enter inside the refrigeration cycle.
- After having closed the two service valves, shut down the compressor, and then remove the refrigerant pipe.

If removing the refrigerant pipe while the compressor is operating with the service valve opened, it may cause air suction and overpressure inside the refrigeration cycle, resulting in burst of the unit or injury.

7 ELECTRICAL WORK

WARNING

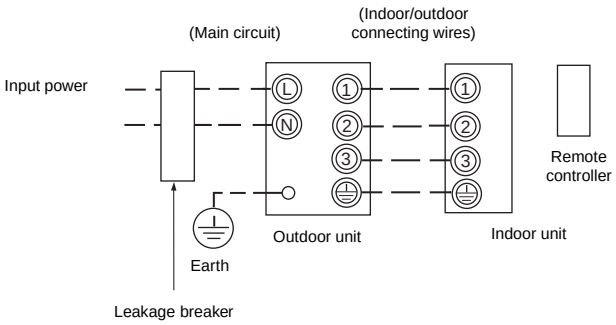
- Be sure to comply with local regulations/codes when running the wire from outdoor unit to indoor unit.
  (Size of wire and wiring method etc.)
- Capacity shortages of the power circuit or an incomplete installation may cause an electric shock or fire.
- Ensure that all terminals are securely fixed using the specified cables, so preventing any external forces having a negative effect on the terminals.
- Improper connection or fixing may cause a fire.
- Be sure to connect earth wire (grounding work).
- Incomplete grounding cause an electric shock.

CAUTION

- Use a circuit breaker of a type that is not tripped by shock waves.
- Incorrect/incomplete wiring will cause electrical fires or smoke.
- Prepare the power source for exclusive use with the air conditioner.
- This product can be connected to the main power.
  Fixed wire connections:
  A switch that disconnects all poles and has a contact separation of at least 3 mm must be incorporated in the fixed wiring.

Wiring connection

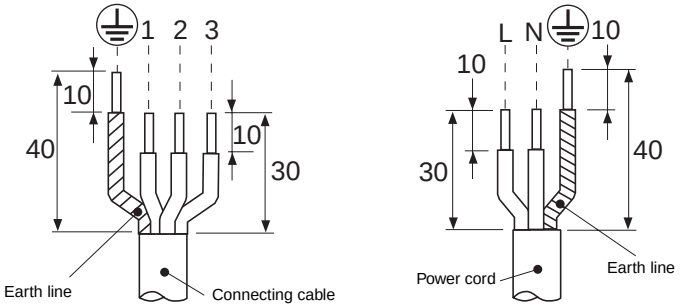
- The dashed lines show on-site wiring.



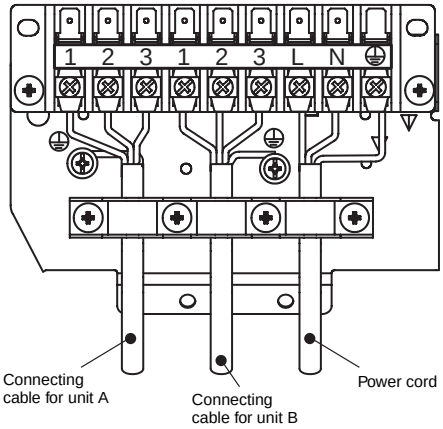
- Connect the indoor/outdoor connecting wires to the identical terminal numbers on the terminal block of each unit.
- Incorrect connection may cause a failure.

1. Remove the service valve cover from the outdoor unit.
2. Remove the cord clamp.
3. Connect the power cord and the connecting cable to the terminal as identified by the matching numbers on the terminal block of indoor and outdoor unit.
4. Secure the power cord and the connecting cable with the cord clamp.
5. Attach the service valve cover on the outdoor unit.

Stripping length of connecting cable for outdoor unit



Terminal block



8 GROUNDING

This air conditioner must be grounded without fail.

- Grounding is necessary not only to safeguard against the possibility of receiving an electric shock but also to absorb both the static, which is generated by high frequencies and held in the surface of the outdoor unit, and noise since the air conditioner incorporates a frequency conversion device (called an inverter) in the outdoor unit.
- If the air conditioner is not grounded, users may receive an electric shock if they touch the surface of the outdoor unit and that unit is charged with static.

9 TEST OPERATION

Miswiring (Mis-piping) check

1. Turn on the power breaker.
2. Set all the connected indoor units to COOL mode and check the operation.

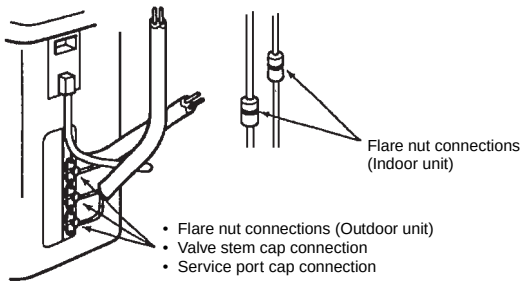
- It is unnecessary to set the temperature.
- Miswiring checks cannot be executed when the outdoor air temperature is 5°C or less.

3. Start the check.

- Perform a cooling operation only for the indoor unit which is installed in room A, and check that cool air is being blown out from the indoor unit in this room.
- If cool air is not being blown out from the indoor unit in room A, touch the piping used to make the connections to room B where the indoor unit is shut down. If it is verified that the piping is cold to the touch and that refrigerant is circulating, it means that a mistake has been made in the connection of the piping and/or wiring to the indoor units.
  Turn off the power breaker, and check the situation again.

Gas leak check

- Check for gas leaks at all connections of the indoor unit and outdoor unit.
- For R410A, use the leak detector exclusively manufactured for R410A refrigerant.



Test operation

1. When performing the test operation during the summer months, proceed with the cooling operation first, and after the room temperature has dropped, perform the heating operation.
   (Heating operation: Remote control temperature setting of 30°C)

- When performing the test operation during the winter months, proceed with the heating operation first, and then perform the cooling operation.
  (Cooling operation: Remote control temperature setting of 17°C)

2. The test operation must be performed without fail one room at a time for all the rooms concerned, and the operations for cooling and heating must each be performed for at least 10 minutes.

- The cooling and heating operations can be performed using the room temperature sensors of the indoor units.
  Cooling operation: Expose the room temperature sensor to a hair dryer or other heating device.
  Heating operation: Hold a chilled towel or other article up against the room temperature sensor.

What is to be explained to the customers

- While referring to the OWNER'S MANUAL which is provided with the indoor unit, have the customers actually use the controls on the unit for themselves, and show them how to operate the unit correctly.
- Do not select the cooling operation and heating operation at the same time. When these indoor units in two or more rooms are to be operated at the same time, the type of operation in the room where operation was first initiated takes precedence.
- When the air conditioner is started up or when its operation mode is switched, operation will not be initiated for about 3 minutes. This delay is designed to protect the main unit, and it is normal and not indicative of any malfunctioning.
- When the outdoor temperature drops, power is supplied to the compressor to preheat it as a way of protecting the compressor. Use the air conditioner with the circuit breaker left at the "on" setting. The power consumption level while the compressor is in the preheat status is approximately 20 W.
- This outdoor unit uses an electronic expansion valve. It will make a rattling sound when the power is turned on and when operation is started up at a rate of once every one to two months: This is normal and not indicative of any malfunctioning. This sound is made when the initial settings for ensuring that control will be exercised under the optimum conditions are being established.
- During heating operations, refrigerant will flow to the indoor units which are currently shut down as well: For this reason, sounds may be heard from the units which are shut down or the surfaces of the indoor units may warm up.

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